

Zero Retries issue 0084 2023-02-03

Zero Retries is an independent newsletter about technological innovation in Amateur Radio. Zero Retries promotes Amateur Radio as (literally) a license to experiment with radio technology.

About Zero Retries

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Request To Send

50th Edition of ARRL Handbook

One of my recent donations to [DLARC](#) was a battered copy of the 1973 edition ARRL Handbook - the 50th edition. Since I was thirteen at the time of publication, this one was obtained used. The slightly musty smell upon opening it was comforting.

Having recently contributed to the 100th edition of the ARRL Handbook, I thought I'd check out the Zero Retries Interesting chapter - Chapter 15 - Specialized Communications Systems. The subjects in this chapter were:

- Radioteletype (RTTY) - pages 458 - 464

- Amateur Television (ATV) - pages 464 - 466
- Slow-Scan Television (SSTV) - pages 466 - 470
- Facsimile - pages 471 - 473
- Space Communications - pages 474 - 476
- Phone Patching - pages 476 - 482

I was a bit nostalgic about this 50th edition and considered keeping it in my (dwindling) collection of Amateur Radio books. In the end I decided to send it to DLARC where it can, hopefully, eventually, join the 99 other editions of the ARRL Handbook digitized and preserved for posterity. When it's digitized, I'll provide a link to it on DLARC.

[My CQ Digital Wireless Columns Now Online](#)

Beginning 2000-09 and ending 2002-06 (*two decades ago - wow...*), I wrote thirteen "Digital Wireless" columns in CQ Magazine. Many of these columns were similar themes as [SuperPacket blog] and my newsletter Zero Retries.

...

I will eventually do a "revisit" post about these columns. Some of my writing there aged well. Some of it hasn't :-(

Things I'd Like to Read on DLARC - Please Donate!

This will be a periodic mention here in Request To Send - publications from the past that I would love to read (often for the first time) on Digital Library of Amateur Radio & Communications... but are not there (yet). In this installment:

- **220 Notes Newsletter** - This was a beloved newsletter that (at least in my memory) helped popularize the 220-225 MHz Amateur Radio band, and served as a knowledgeable and reasonable source of discussion once the FCC decided to remove 220-222 MHz from Amateur Radio use. I cannot find any archive of this newsletter online.
- **W5YI Report Newsletter** - Another beloved newsletter which reported comprehensively on the US Amateur Radio industry. It did a pretty good job (at least in my memory) of dispassionately reporting on regulatory issues. I called the W5YI Group (W5YI is long since a Silent Key) a few months ago when DLARC began accepting donations of material... and even *they* do not have an archive of the W5YI Report that could be donated to DLARC. Sigh...
- Any... *All... EVERY* newsletter from groups that were substantially involved with Amateur Radio Packet Radio. *C'mon folks, dig deep* into those drawers and bookcases and contact Kay Savetz K6KJN to arrange a donation - kay@archive.org.

Antenna Test Imminent...

Just as I was finishing up this issue (Friday AM), my weather app alerted me to a high wind

warning here in Whatcom County, Washington. I guess *this will be the day* of the big test of my new antenna installation.

de Steve N8GNJ

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Repeaters for US Amateur Radio 222-225 MHz Band?

Steve Stroh N8GNJ

The Zero Retries Interesting angle on this story is that the US 222-225 MHz band is generally underutilized and thus it's a good band for data communications, including data communications repeaters. But, it's tough to find Amateur Radio equipment for 222-225 MHz these days. Thus, this brief discussion.

Disclaimer - *I understand the basics of repeaters, but do not consider myself knowledgeable about building, installing, or maintaining repeaters, or in particular, repeaters for the Amateur Radio 222-225 MHz band. For Amateur Radio, where you can rarely “just point the money gun”, building, installing, and maintaining repeaters is a rare skillset. Thus I offer this article as food for thought.*

At a recent gathering of Amateur Radio friends, the subject of available equipment for the US 222-225 MHz band came up. When I brought up that Bridgecom Systems was again manufacturing their [BCR-220 repeater](#) and [BCM-220 mobile](#), one well-informed friend mentioned that on the repeater-builder mailing list “[reviews are mixed](#)” regarding these two units.

After reading through the discussion, if I was considering putting up a new 222-225 MHz repeater, I'd now be hesitant to consider a Bridgecom BCR-220 for use on a high profile commercial site where it could potentially interfere with commercial (and public safety) two way radio systems.

As I discussed in ZR 0020 - Bridgecom Systems Exits the 222-225 MHz Repeater Business, I purchased the “last” BCR-220 (at the time of purchase, it had been discontinued; they're now in production again). At a minimum, my BCR-220 will eventually go into service from N8GNJ Labs as a data repeater. Once I get it working as desired at N8GNJ Labs, there are two potential higher profile locations where it could be installed for better coverage than from N8GNJ Labs. Neither of those sites are commercial two way radio sites, though I will take care to insure that my BCR-220 does not interfere with any other system... however expensive it may be to do so.

Continuing to read through the discussion, there were mentions of some alternatives to the BCR-220, but it was troubling that the strongest recommendations for alternative sources of repeaters for 222-225 MHz were based on Motorola [Micor](#) and [Mitrek](#) units. I'm told that both are fine products, produced in many variants, able to be modified for 222-225 MHz, and very reliable... but both have been out of production for *perhaps a couple of decades*?

My knowledgeable friend said that the newest equivalent of the Micor and Mitrek was the (also discontinued, but more recently) [Motorola CDM1550](#) which has proven to be usable for repeater use when the appropriate modifications are done, including running them at low power and using an external power amplifier. One minor downside to the CDM1550 is that as commercial radios, they are subject to the FCC's "narrowbanding" mandate for commercial two-way radio and thus are only capable of a 12.5 kHz channel, instead of the more usual (for Amateur Radio) 25 kHz channel.

I don't remember where I saw the reference, but Spectra Engineering's [MX-800 Base Station and Repeater](#) offers "Band F 195-225 MHz". (I have no idea of pricing.) Keep in mind that that the US Amateur Radio 222-225 MHz (and formerly, 220-225 MHz) is a relatively unique band in Amateur Radio worldwide (hence the rarity of equipment these days). Outside the Americas, 220-225 is just another commercial two-way radio band, thus the MX-800 is manufactured in Australia.

Somewhere in the research for this article I saw a mention of the TYT TH-9000D 220-260 MHz Mobile Transceiver available on Amazon. I've discussed this radio in earlier editions of Zero Retries:

- TYT TH 9000D Monoband Radios Can Be Modified for Data (ZR 0018)
- A Few Bits More on the TYT TH-9000D (ZR 0019)
- Data Communications Adapter for TYT TH-9000D Radio (ZR 0065)

The first article included a mention that some have used this radio for building 222-225 MHz repeaters... apparently similar to the now-popular approach of combining two mobile radios into a repeater, used by Bridgecom for the BCR-220 (and Icom and Yaesu for their Amateur Radio repeaters).

It's almost completely forgotten now, and cannot be found online (see **Yet Another Plug for Digital Library of Amateur Radio & Communications (DLARC)** below), but there was a newsletter called 220 Notes that provided specialized information on the (then) Amateur Radio 220-225 MHz band and equipment. Now that it's "easy" to produce email newsletters, perhaps it's time to revive 220 Notes. *I really hope that a collection of 220 Notes will be donated to DLARC for posterity.*

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Brief Review of ARDC Community Meeting 2022-01-21

Steve Stroh N8GNJ

[ARDC](#) held its [first Community Meeting of 2023](#) on Saturday 2022-01-21 via Zoom. My quick looks at the attendees showed 60+, including two of the five Directors of ARDC - Bdale Garbee KBOG and John Gilmore W0GNU, and all ARDC staff. Unlike previous ARDC Community

Meetings, you had to pre-register to be notified of the Zoom link for the meeting. Here is the meeting material parsed from various emails, blog posts, etc.:

- [ARDC 2022 Annual Report](#) (22 pages PDF)
- [ARDC 44Net Assessment Results](#) (52 pages PDF)
- [Recording of the meeting](#)
- [Meeting slide deck](#)

The meeting was well-run and began with a brief shout-out to the new members of the ARDC Grants Advisory Committee (GAC) and new members of the Technical Advisory Committee (TAC). Most of the meeting consisted of highlights from the two documents, with a smattering of questions.

As one of the members of the 2022 Grants Advisory Committee, most of the grants presentation was familiar to me, so I can't objectively assess ARDC's grant work in 2022. *Non-objectively*, I think we (the 2022 Grants Advisory Committee and ARDC in general) did a good job distributing ARDC grants when presented with a much greater number of grant proposals than ARDC had to deal with prior to 2022.

Thus for me, the most interesting part of the meeting was a quick rehash of the ARDC 44Net Assessment Results. This is the most encouraged I've been about 44Net being "modernized" since ARDC set up its endowment and turned most of its attention (in my opinion) to grantmaking.

One of the things mentioned was that ARDC will be working to improve their website in 2023. I look forward to that - it's a bit frustrating to have to dig these important documents out of emails instead of an easy to locate link on a website.

Concurrent with the community meeting, ARDC transitioned their website domain names from ampr.org to ardc.net. From my observation, the transition was seamless.

From ARDC - [January 21, 2023 Community Meeting Recap](#)

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Yet *Another* Plug for Digital Library of Amateur Radio & Communications (DLARC)

Material that *I've* contributed to DLARC is now showing up in the DLARC section of Internet Archive... if you know where to look. One example is [2017 Mike & Key Amateur Radio Club Amateur Radio Special Events & Information Guide - Puget Sound and Surrounding Area](#). Not only was this booklet scanned and readable / browseable / downloadable, but it was run through high-accuracy Optical Character Recognition (OCR) and thus the text can be copied and pasted.

This annual booklet is a great service of the [Mike & Key Amateur Radio Club](#), but an electronic version isn't available on the club website, nor is there an archive of past editions. Now, it's preserved for posterity on DLARC. In discussing my contributed items, Kay Savetz K6KJN mentioned:

As of [2023-01-22] DLARC has more than **51,000 items**.

As I've said a few times now, I gotta get busy pushing *more* of my rare Amateur Radio material to DLARC. I spent most of a Sunday filling two more boxes (total of eleven now). DLARC sent me a horrifying photo of one of my heavier boxes in a previous shipment - despite my packing job and choice of a heavy duty box, it was split open. Apparently FEDEX Ground throws boxes. Fortunately no contents were lost, but lesson learned - don't spare the expense of using *lots* of strong (nylon strapping) tape.

Consider this a personal plea for all you Zero Retries readers to dig deep for unique Amateur Radio material that you don't want to see vanish and get in touch with K6KJN (kay@archive.org) to arrange for your donation of material. It's not going to do you, or Amateur Radio, any good to have it all recycled or landfilled when you can no longer keep it. And if you think "Oh, I've got plenty of time yet..." consider:

- You don't *really* know how much time you have left.
- You really don't want to leave shelves, boxes, drawers of material for your survivors to deal with.
- In contrast to all your radios and other carefully acquired and beloved *junque*, there's almost no resale market for Amateur Radio printed material. Unless you make provisions ahead of time, it's almost certainly going into the recycle bin when you're gone.
- DLARC *is funded at this point in time* by a grant from ARDC. That grant funding is finite - there's no guarantee of a future grant to continuing to grow DLARC, or how long Internet Archive can continue to accept material for DLARC. Thus, *now* is a *good* time to donate material to DLARC.

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ZR > BEACON

- [Ask HN: What's with the DIY state of the art long-range Wi-Fi?](#)
Hacker News is a news site (link aggregator) that's quite productive for me as a discovery site for useful things I wasn't looking for. This discussion is about Do It Yourself (DIY) microwave networking. Two nuggets in the discussion was a mention of [Freifunk](#), a community wireless network in Germany (freifunk.net) and an online book [Wireless Networks in the Developing World](#):
This book is a practical guide to designing and building wireless networks in local communities, enhancing lives through improved communication, access to information

for educational, social and economic growth. Its primary goal is to help expand access to the Internet and to expand the deployment of community networks where there is currently no infrastructure to enable this to happen. Written by subject matter experts who have vast experience in deploying wireless networks in the field and connecting communities to the global Internet.

- [Show some Valentine's Day Love for your favorite ham radio FOSS project](#)

... by nominating it for the Amateur Radio Software Award!

Nominations for the 2023 awards must be submitted by February 14st, 2023. Please use the [awards nominations form](#) to submit your nominations. The [award rules](#) and the [faq](#) are good resources to ensure your nominations are eligible and may answer any questions you have.

The Amateur Radio Software Award is in its fourth year. Past recipients were Anthony Good (K3NG) for his Arduino CW Keyer, Jordan Sherer (KN4CRD) for JS8Call, and David Rowe (VK5DGR) for Codec 2. Checkout the [Award Recipients](#) page for more details about the past recipients.

The Amateur Radio Software Award is an annual international award for the recognition of software projects that enhance amateur radio. The award aims to promote amateur radio software development which adheres to the same spirit as amateur radio itself: innovative, free and open.

I'll get my nomination in for my favorite open source project - [KA9Q's NET / NOS](#). I owe KA9Q a debt for this great software. (Unfortunately, ka9q.net has lapsed into spamdom, but the link is to the Wayback Machine's last good snapshot of KA9Q's web page.)

- [Has anyone come up with a way to grab 28 MHz of spectrum and decode FT8 on all \[HF\] bands simultaneously? Seriously, this should be a thing.](#)

Interesting discussion on Twitter, started by Jeff Keyzer W6OHM... one of the few that I've seen of late that are Zero Retries Interesting under Twitter's new management.

Feedback Loop

- Comments re: Zero Retries 0083 (Space in this issue doesn't allow a synopsis.)

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless technology, and make Amateur Radio

more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything*!
- Pseudostaffers [Dan Romanchik KB6NU](#) and [Jeff Davis KE9V](#) for continuing to spot, and write about “Zero Retries Interesting” items on their blogs that I don’t spot on my own.
- [Amateur Radio Weekly](#) consistently surfaces “Zero Retries Interesting” stories.
- Andreas Spiess HB9BLA’s YouTube Channel - [HB9BLA Wireless](#) features Zero Retries Interesting content.
- The [Substack email publishing platform](#) makes Zero Retries possible. I recommend it for publishing newsletters.

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If you’re a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon - n8gnj@mastodon.radio - just click:

[Zero Retries / N8GNJ on Mastodon](#)

Email issues of Zero Retries are “instrumented” by [Substack](#) to gather basic statistics about opens, clicking links, etc. I don’t use such information in any way other than seeing that most subscribers actually do read Zero Retries.

More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA.

2023-02-03

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